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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Coffee Maker

(72) Fontyn, Jan H. - Canada ;

(71) Godfrey Aerospace Inc. - Canada ;

(57) 8 Claims

Notice: This application is as filed and may therefore contain an incomplete specification.



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**ABSTRACT**

Disclosed is a coffee maker having an upper compartment in which can be slid a basket provided with a spring biased drip-stop valve, and a lower compartment in which a coffee pot can be inserted. The upper compartment has a top panel that can be moved down by a manually operated lever, and a spring-loaded double floor that is also movable downwardly and provided with an extension that is sized and positioned to fit into the neck of the coffee pot located in a lower compartment so as to close this coffee pot and, more importantly, to lock it in the lower compartment. This coffee maker is particularly well adapted for use in aircrafts, since it avoids any dripping within the cabin when the drawer is removed, and, more importantly, it allows the basket and coffee pot to be "locked" within their respective compartments when the lever is pushed down, to prevent them from falling out during take-off and landing.

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**COFFEE MAKER**

**BACKGROUND OF THE INVENTION**

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**a) Field of the Invention**

The present invention is concerned with an improved coffee maker especially devised for use in an aircraft.

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**b) Brief description of the prior art**

Most of the commercial aircrafts include one or more coffee makers for use by the flight attendants to prepare coffee during a flight. Like most of the domestic coffee makers, the coffee makers used in aircrafts are electrically operated and include an upper compartment in which can be inserted a basket  
15 devised to receive ground coffee either in a bag or in a can. They also comprise a lower compartment located under the upper compartment and sized to receive a coffee pot. Means are provided for electrically heating water supplied from a water source and for dispensing the so-heated water into the basket when the same is in the upper compartment so as to form liquid coffee that may flow down  
20 by gravity into the coffee pot located in the lower compartment, via a hole provided in the bottom of the basket and an opening provided in the partition separating the upper and lower compartments, the hole and opening being in registry with each other and with the coffee pot. Means are also provided for locking the basket and the coffee pot in their respective compartments to prevent them from falling out  
25 during take off and landing. These means are essentially mechanical and include a manually operable lever projecting forwardly so as to be easily accessible by the flight attendants.

To the Applicant's knowledge, most of the patents that have been applied for so far in this very specific field are essentially concerned with  
30 improvements to the structure of the electrical or electronical components of these coffee makers, which must satisfy very constraining regulations to be accepted by the airliners. In particular, any parasitic source that could interfere with the aircraft

electronic equipment are banished. Examples of such patents are as follows:

British laid-open patent application No.:

5                      2,203,633      of 1988      (Britax)

U.S. patent Nos.:

                    3,583,308      of 1971      (Williams)  
 10                   3,596,588      of 1971      (Moss)  
                     3,898,428      of 1975      (Universal Oil Products)  
                     4,256,030      of 1981      (Koninlijke Fabriek)  
                     4,949,621      of 1990      (Norbskog)

15                      The Applicant is also aware of a plurality of patents disclosing filter  
                     vessels or baskets for use in domestic coffee makers, which incorporate a spring-  
                     loaded drip-stop valve that can be operated by a lever pivotably secured either to  
                     the basket itself or to the coffee maker. This operating lever is itself operated by  
                     the coffee pot when the same is inserted into the machine. The purpose of this  
 20                   valve is essentially to prevent coffee from dripping out of the basket when the same  
                     is removed to throw away the bag or filter containing the ground coffee after it has  
                     been used.

                    In this connection, reference can be made to U.S. patent No.  
                     4,843,955 which discloses a filter vessel provided in the spring-loaded valve in its  
 25                   bottom, which is actuated by a lever which is operated by the coffee pot or by a  
                     coffee cup when the same is lifted up.

                    Reference can also be made to U.S. patent No. 5,170,694 which  
                     discloses a filter vessel provided with a spring-loaded valve assembly that is  
                     operated by a small adjustable projection provided in the lid of the coffee pot.

30                      Reference can further be made to U.S. patent No. 4,924,922 which  
                     discloses a coffee maker for use with a coffee pot with a lid incorporating a spring-  
                     biased valve. When the coffee pot is inserted in the coffee maker, mutual pressure

between the lid and the filter basket which is also provided with a drip-stop valve, causes simultaneous opening of both valves and sealing of the lid onto the bottom surface of the basket. Removal of the coffee pot from the coffee maker automatically closes the valves of both the basket and the lid of the basket, whereby dripping from the coffee maker is prevented. Advantageously, the flow capacity of the drip stop valve of the basket is less than that of the valve of the lid to control coffee flow.

### **SUMMARY OF THE INVENTION**

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An object of the present invention is to provide a coffee maker especially devised for use in an aircraft, which comprises very simple yet efficient means for avoiding any dripping within the cabin when the basket is removed from the upper compartment to throw away the ground coffee contained therein.

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Another object of the invention is to provide a coffee maker for aircraft, which also comprises means for locking the basket and coffee pot in their respective compartments, such locking being particularly useful and actually required during take-off and landing.

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A further object of the invention is to provide a coffee maker for aircraft, which comprises a manually releasable latch to automatically lock the lever used to lock the basket and coffee pot in their respective compartments after this lever has been moved down in operative position.

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More particularly, the invention provides a coffee maker comprising an upper compartment in which can be slid a basket provided with a spring-biased drip-stop valve, this upper compartment having a top panel that is movable downwardly and a spring-loaded double floor that is also movable downwardly and is provided with an extension that is sized and positioned to fit into the neck of the coffee pot located in a lower compartment so as to close this coffee pot and, more importantly, lock it in the lower compartment.

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In accordance with the invention, the first object mentioned hereinabove is achieved with a coffee maker of the same type as disclosed hereinabove, which is improved over those already known in that:

- its basket is shaped as a flat-bottomed drawer that can be slid into the upper compartment;

- the hole in the bottom of the basket is normally held closed by a spring-loaded valve operatively connected to an actuating member mounted  
5 within the drawer;

- the actuating member has at least one actuating extremity projecting upwardly and outwardly from the basket when the valve is held closed by the spring; and

- the upper compartment also has a top panel that is slidably  
10 movable up and down by means of a pivotable lever.

In use, pushing down of the lever after sliding of the basket in the upper compartment causes the top panel of the upper compartment to move down and to contact and push down each actuating extremity of the actuating member, thereby causing the valve of the basket to open.

15 In accordance with the invention, the second object mentioned hereinabove can be achieved by devising the coffee maker so that:

- the upper compartment has a spring-loaded double floor on which the drawer can be slid and from which a tubular member projects downwardly through the opening provided in the partition; and

20 - the tubular member has an upper end opening into the double floor so as to be in open communication with the upper compartment, and a lower end extending in the lower compartment, this lower end being connected to and in open communication with a cap-shaped member sized to fit into the upper opening of the coffee pot when the double floor is moved down.

25 Then, pushing down of the lever to open the valve of the basket also causes the basket to press on the double floor and push it down, thereby causing the cap-shaped member to fit into the neck of the coffee pot and thus lock the coffee pot in the lower compartment.

30 As soon as the lever is lifted up, it releases the top panel and the actuating member and thus causes the valve of the basket to close, thereby preventing any dripping when the basket is removed. At the same time, the double floor is released and causes the cap-shaped member to move up and release the

coffee pot.

In accordance with the invention, the third object mentioned hereinabove can be achieved by providing the coffee maker with a manually releasable latch as disclosed above, to lock the lever in down position.

5 As can be appreciated, the structure of this coffee maker is particularly well adapted for use in aircrafts, since it avoids any dripping within the cabin and, more importantly, it allows the basket and coffee pot to be "locked" within their compartments when the lever is pushed down, such a locking being compulsory during take-off and landing.

10 The invention and its advantages will be better understood upon reading the following non restrictive description of a preferred embodiment thereof, made with reference to the accompanying drawings.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

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Figure 1 is a schematic, side elevational view in cross-section of a coffee maker according to the invention, showing its lever in upper position and the basket outside of the upper compartment;

20 Figure 2 is a view similar to the one of Figure 2, showing the basket in the upper compartment and the lever moved down in lower position;

Figure 3 is an exploded perspective view of the basket of the coffee maker shown in Figures 1 and 2.

#### **DESCRIPTION OF A PREFERRED EMBODIMENT**

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30 The coffee maker 1 according to the invention as shown in the accompanying drawings comprises an upper compartment 3 in which a basket 5 devised to receive ground coffee 7 either in a bag or a filter can be inserted. The coffee maker 1 also comprises a lower compartment 9 located under the upper compartment 3 and separated therefrom by a partition 11. As is shown, the lower compartment 3 is sized to receive a coffee pot 13 (shown in part only), which is provided with a neck defining an upper opening 15.

Means (not shown) are provided for heating water and for dispensing the so-heated water via a conduit 17 into the basket 5 when the same is inserted in the upper compartment 3, so as to form liquid coffee that may flow down by gravity into the coffee pot 13 located in the lower compartment 9, via a hole 19 provided in the bottom 21 of the basket (see Fig. 3), and an opening 23 provided in the partition 11.

Referring now to Fig. 3, the basket 5 used is the coffee maker according to the invention is advantageously shaped as a flat-bottomed drawer that can be slid into the upper compartment 3.

10 The hole 19 in the bottom 21 of the basket 5 is normally held closed by valve 25 loaded by a spring 27 and operatively connected to an actuating member 29 mounted within the drawer. As is shown, the actuating member 29 is U-shaped and slidably mounted in grooves 31 provided in lateral walls 33 of the basket. It has also a central bottom portion 35 and two vertical legs 37 with upper  
15 ends 39 that project upwardly and outwardly from the upper edges of the lateral walls 33 of the basket. The spring-loaded valve 25 closing the hole 19 in the bottom of the basket is directly connected to the central bottom portion 35 of the U-shaped actuating member 29 as is shown, so as to move in unison therewith.

Referring back to Figs. 1 and 2, the upper compartment 3 has a  
20 double floor 41 which is upwardly biased by a spring 43. This double floor is sized and shaped to allow sliding of the drawer on it. A tubular member 45 integral to the double floor 41 projects downwardly from the same through the opening 23 provided in the partition 11. This tubular member 45 defines a passage 47 having an upper end opening into the double floor so as to be in open communication  
25 with the upper compartment 3, and a lower end extending in the lower compartment 9. As is shown, the lower end of the tubular member 45 is connected to and in open communication with a cap-shaped member 49 sized to fit into the upper opening 15 of the coffee pot 13 when the double floor 41 is moved down.

Advantageously, the cap-shaped member is sized and shaped to  
30 engage and seal the neck of the coffee pot 13 when the double floor 41 is pushed down.

As is further shown, the upper compartment 3 also has a top panel



51 that is slidably movable up and down by means of a lever 53 pivotably mounted about a pivot axis 55 and provided with a roller 57 bearing onto the top panel 51. Advantageously, the lever 53 has a handle 59 that projects forwardly and outwardly from the coffee maker 1 so as to be easily accessible.

5 In use, pushing down of the lever 53 after having slid the basket 5 in the upper compartment 3 causes the top panel 51 of the upper compartment to move down and to contact and push down the upper ends 39 of the actuating member 29 thereby causing the valve 25 of the basket to open. Such a pushing down of the lever 53 also causes the basket 5 squeezed between the top panel 51  
10 and the double floor 41 to press on and push down the double floor 41 thereby causing the cap-shaped member 49 to fit into the neck of the coffee pot 13 and thus to lock this coffee pot in the lower compartment 9.

As soon as the lever is lifted up, it releases the top panel and the actuating member and thus causes the valve of the basket to close, thereby  
15 preventing any dripping when the basket is removed. At the same time, the double floor is released and causes the cap-shaped member to move up and realise the coffee pot.

As can be appreciated, the structure of this coffee maker is particularly well adapted for use in aircrafts, since it avoids any dripping within the  
20 cabin and, more importantly, it allows the basket and coffee pot to be "locked" within their compartments when the lever is pushed down, such a locking being compulsory during take-off and landing.

If desired, for obvious safety reasons, a manually releasable latch (not shown) of very conventional structure can be mounted onto the lever so as to  
25 automatically lock this lever after it has been moved down. Then, the locking is in two stages: firstly, an overcentered spring-loaded action caused by the design of the lever 53 and the spring 43 associated with the double floor 41 and tubular member 45 and, secondly, a spring loaded latch preferably located on the lever 53 which automatically engages with the housing requiring depression of an actuating  
30 bar to release the latch.

Control means (not shown) may also be incorporated into the coffee maker to allow hot water to be poured into the basket 5 only when the lever 53 has

been moved down.

Of course, numerous modifications can be made to the structure of the above described coffee maker without departing from the scope of the present invention as defined in the appended claims.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

- 5                   1.     In a coffee maker of the type comprising:
  - an upper compartment in which a basket devised to receive ground coffee can be inserted, said basket having a bottom wall with a hole therein;
  - a lower compartment located under the upper
  - 10   compartment and separated therefrom by a partition, said lower compartment being sized to receive a coffee pot provided with an upper opening; and
  - means for dispensing hot water into the basket when the same is inserted in the upper compartment so as to form liquid coffee that may flow down by gravity into the coffee pot located in the lower compartment through
  - 15   the hole provided in the bottom of the basket and an opening provided in the partition,

the improvement wherein:

  - said basket is shaped as a flat-bottomed drawer that can be slid into the upper compartment;
  - 20           the hole in the bottom of said basket shaped as a drawer is normally held closed by spring-loaded valve operatively connected to an actuating member mounted within said drawer;
  - said actuating member has at least one extremity projecting upwardly and outwardly from the basket when the valve is held closed
  - 25   by the spring; and
  - said upper compartment also has a top panel that is slidably movable up and down by means of a pivotable lever,
  - whereby, in use, pushing down of the lever after sliding of the basket in the upper compartment causes the top panel of said upper compartment
  - 30   to move down and to contact and push down said at least one actuating extremity of the actuating member ther by causing the valve of the basket to open.

2. The improved coffee maker of claim 1, wherein:

- the actuating member is U-shaped and slidably mounted in grooves provided in lateral walls of the basket;

5 - said actuating member has a central bottom portion and two vertical legs with upper ends projecting upwardly and outwardly from the lateral walls of the basket, each of said upper ends acting as one of said at least one actuating extremity of the actuating member; and

10 - the spring-loaded valve closing the hole in the bottom of the basket is directly connected to the central bottom portion of the U-shaped actuating member so as to move in unison therewith when the top plate is pushed down.

15 3. The improved coffee maker of claim 2, wherein the top panel is sized and shaped to engage and seal the basket when the lever is pushed down.

4. The improved coffee maker of any one of claims 1 to 3, wherein:

20 - the upper compartment has a spring-loaded double floor on which said drawer can be slid and from which a tubular member projects downwardly through the opening provided in the partition; and

25 - said tubular member has an upper end opening into said double floor so as to be in open communication with the upper compartment, and a lower end extending in the lower compartment, said lower end being connected to and in open communication with a cap-shaped member sized to fit into the upper opening of the coffee pot when the double floor is moved down;

whereby, in use pushing down of the lever also causing the basket to press on the double floor and push it down, thereby causing the cap-shaped member to fit into the neck of the coffee pot and thus lock said coffee pot in the lower compartment.

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5. The improved coffee maker of claim 4, wherein the cap-shaped member is sized and shaped to engage and seal the coffee pot when the

double floor is pushed down.

5 6. The improved coffee maker of claim 4, wherein the lever has a handle that projects forwardly and outwardly from the coffee maker so as to be easily accessible.

10 7. The improved coffee maker of claim 6, further comprising a manually releasable latch to automatically lock the lever after it has been moved down.

15 8. The improved coffee maker of claim 6, further including control means to allow hot water to be dispensed into the basket only when the lever has been moved down.

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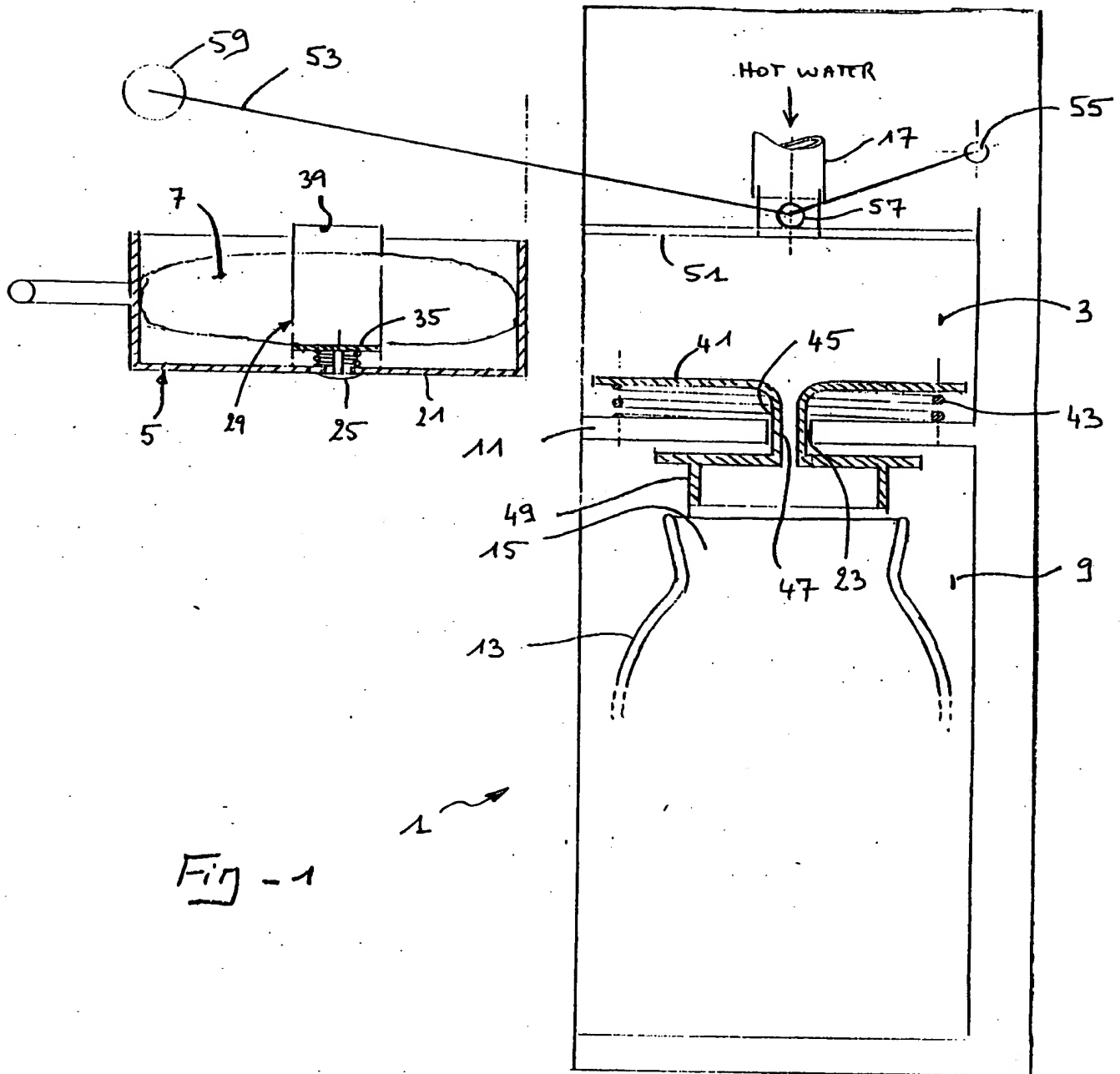


Fig - 1

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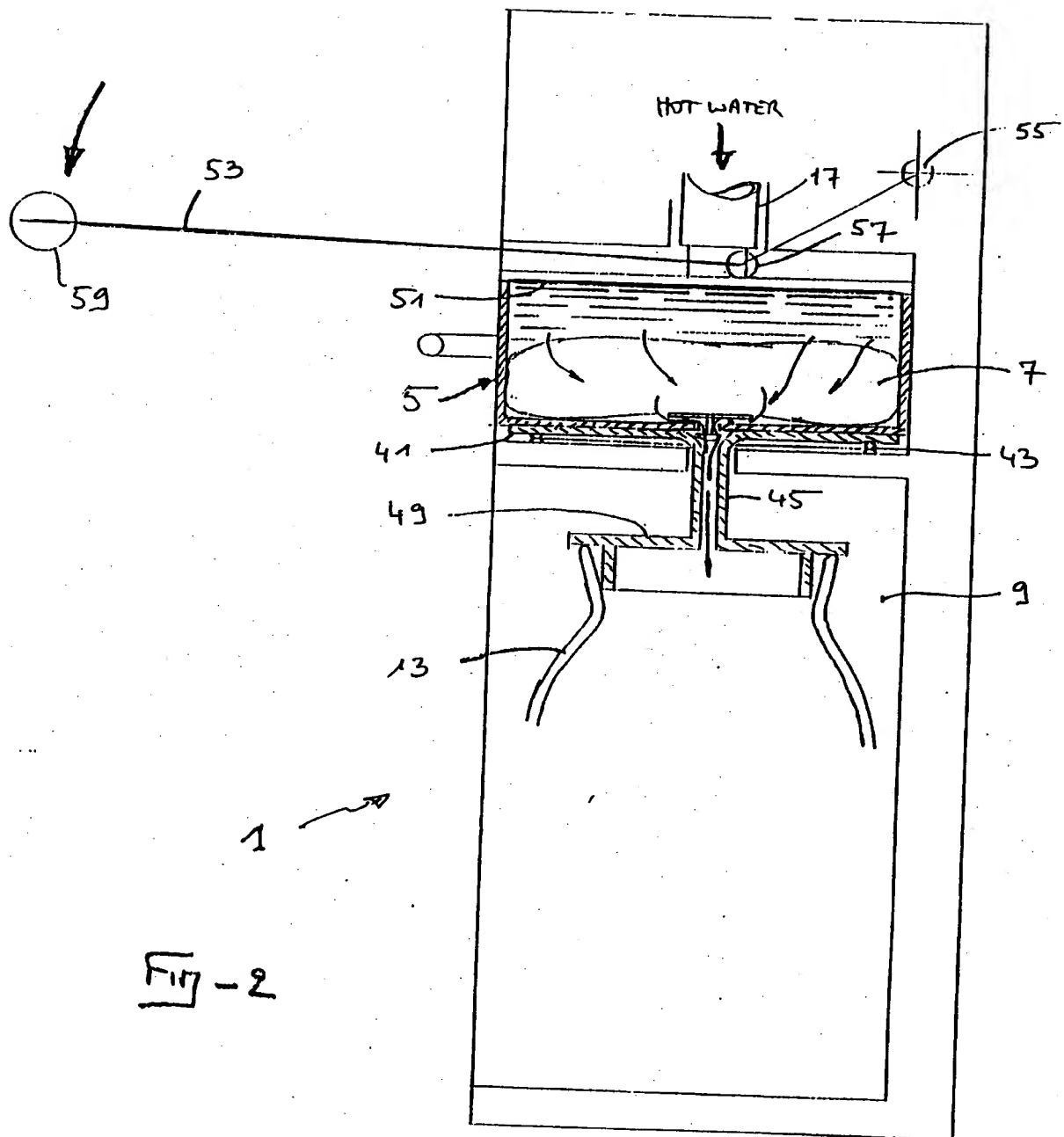


Fig-2

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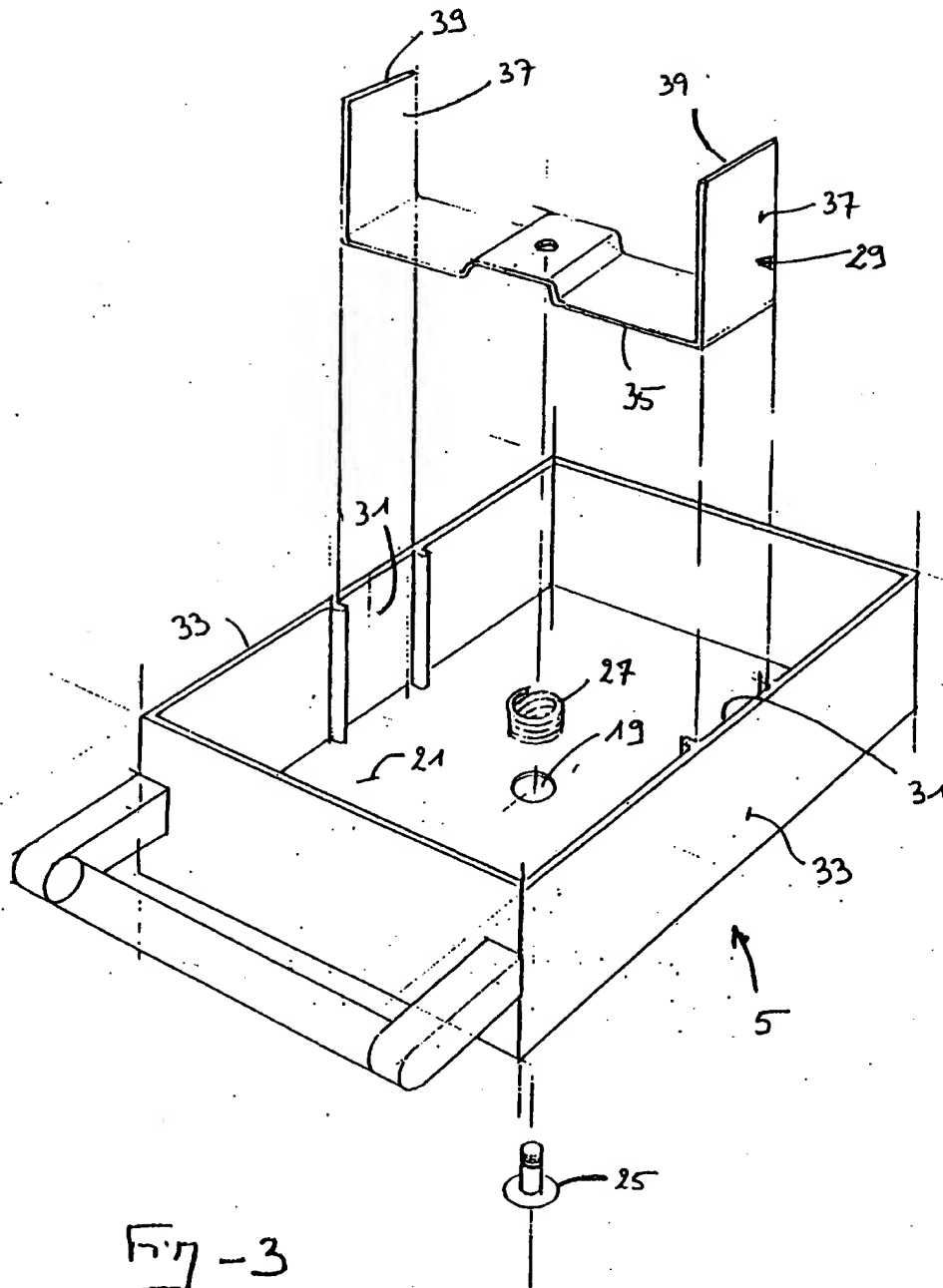


Fig-3